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"Each producer should do their own homework," says Kelly Lund.

'GREEN' WIND POWER SHOWS AMBER LIGHT FOR FARMERS

Wind energy is an option more agricultural producers in Western Canada are considering every year. But what are the true risks and benefits?

Proceed with caution. That's the best advice for farmers contemplating getting involved with wind power at any scale. Now farmers have two new resources to help - a Landowners Guide to Wind Power and a new swath of research into this fast developing area.

Wind power is an area generating more interest from farmers every year, and it's not hard to see why, says Kelly Lund, engineer and energy specialist with Alberta Agriculture and Rural Development (ARD).

At a small scale, wind power offers them more control over energy costs, with the potential to reduce and stabilize those costs. At a large scale, typically through partnering with power companies, it offers producers a new option for generating revenue. At the same time, advances in the quality, performance, economics and availability of the technology are making it more viable in more areas.

However like many areas of emerging technology, the early stages of adoption come with a number of hurdles and important considerations, says Lund. "For producers considering wind power, you want to know clearly what you're getting into and what you're investing in before you take that step."

Small wind turbine technology

The small scale level generally refers to on-farm, non-commercial installations of 50 kW capacity or less. Based on what Lund has seen, the most common turbines purchased by farmers in this small scale range are 10-20 kW sizes. Farmers who go this route want to generate electricity for their own on-farm use to offset some of their energy costs.

The amount of energy produced by these turbines is variable because it depends on how much wind there is in a given time frame. For gaining rough estimates, Lund and colleagues use a formula of the rated size (kW), multiplied by 8760 (hours per year), multiplied by an estimate of the "capacity factor," which refers to how much of the turbine capacity is expected to be used based on wind availability.

"Being able to predict the capacity factor is where the magic happens," says Lund. "We won't have a good handle on true capacity factor until we get some multiyear data on small wind installations, but it's likely anywhere from 10 percent to 20 percent." Based on that estimation, a 10 kW turbine in a moderate wind area (10 percent) would provide about 8760 kW hours of energy per year. The same turbine in high wind area (20 percent) would produce about 17, 520 kW hours per year. A 20 kW machine would produce double those numbers.

The small scale wind turbine option is seeing tremendous growth in interest, says Lund, but it's not for everyone. Only limited areas and situations have the availability and consistency of wind necessary to justify the investment. There are also many pitfalls involved that require careful due diligence to avoid.

One option producers have is to get a wind assessment done, says Lund. "This is an option that can be a strong benefit depending on the scale you are dealing with and your appetite. On the one hand, having an assessment done by a qualified person such as an engineer is the only way to know exactly what capacity of wind resource you have available, and that is especially important if you are investing in a large turbine.

"However, on the other hand, for small turbine projects, the cost of getting an assessment done can be quite high relative to the cost of installing the actual equipment. As a result, it's often not done in those situations."

Just because your neighbour has a wind turbine and it's working well for them doesn't mean it will work for you, says Lund. Wind availability is highly variable. Even when there is enough wind, each situation requires its own best site selection, equipment selection and system design to be successful.

"Each producer should do their own homework, get information and advice, and make choices based on their particular situation."

Investing in small wind turbine technology has been a buyer beware environment. Until recently, there wasn't a certification process for this technology in North America, but that has changed with efforts led by the American Wind Energy Association (AWEA) and the Small Wind Certification Council (SWCC).

"Producers in Alberta can now purchase certified equipment, but they will have to look specifically for it," says Lund. "The first officially certified versions have just started to become available, and there's still a wide range of quality among the equipment in the marketplace."

Getting quality, certified technology is just one component, says Lund. "We're still in an environment where producers should be very careful if they are considering adopting this technology. Performance data has been a big hole. We want to continue to work with producers and some of the pilot efforts out there to monitor how the early adopters are doing and how we can keep getting better."

ARD offers technical expertise and information resources that can help producers who are considering wind power options. It's also expected wind power technology will be increasingly considered as part of provincial and federal renewable energy grant programs available to farmers. For the latest information on resources and programs available, contact the Ag Info Centre at 403 310-3276 (FARM).

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Partnering in large-scale projects

Large scale projects offer increasing opportunity for farmers, particularly in areas such as southern Alberta where power companies are investing in turbines. For farmers in areas with strong, consistent winds, the major opportunity typically stems from their role as landowner, with the potential to negotiate a leasing agreement or other partnering model with a commercial wind developer.

Some producers may even consider setting up and owning their own large scale wind turbine, which they can connect to the grid and use as an additional revenue source.

With large-scale, often the most important thing for producers is to know the wind energy development process, their rights and interests as landowners and how to find and negotiate with a potential commercial partner.

Landowners Guide to Wind Energy

One valuable resource for farmers is the new "Landowners Guide to Wind Energy" publication, released in fall 2010. Designed for landowners in Alberta considering wind energy projects on their land, it was developed by the Pembina Institute, with contributions and support from a number of partners including the ARD AgTech Centre.

The guide provides an overview of the basics. However, it is focused on what landowners need to know about getting involved with large scale commercial developers. "The guide can help farmers prepare for meeting prospective wind energy developers who express interest in their land," says Lund.

A major contribution of ARD was information on micro-generation including the steps and important considerations involved with setting up a micro-generator and connecting it to the grid.

"Micro-generation is relatively new to Alberta," says Lund. "Micro-generation legislation is the set of rules that allows farmers and others to generate their own electricity and receive credit for any power they send to the electricity grid."

The Landowners Guide to Wind Energy is available for free download from the Pembina Institute website at www.pembina.org/pub/2081. ◆

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CENTRE

AgTech Centre
Alberta Agriculture and Rural Development
Technology and Innovation Branch
Environmental Stewardship Division
3020 College Drive South
Lethbridge, Alberta, Canada T1K 1L6
Phone: (403) 329-1212
Fax: (403) 328-5562

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